5:00

COMPARISON OF EPICARDIAL AND ENDOCARDIAL LEAD SYSTEMS FOR AN IMPLANTABLE THIRD-GENERATION HYBRID CARDIOVERTER-DEFIBRILLATOR

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We evaluated clinical efficacy & electrical characteristics of endocardial (ENDO) & epicardial (EPI) shocks in 20 pts with sustained ventricular tachyarrhythmias, mean age 60±10 years, mean LV ejection fraction 37±12% during electrophysiologic studies or at implant of Medtronic 7216A hybrid cardioverter-defibrillator. Monophasic simultaneous or sequential shocks were applied through a triple electrode system viz ENDO=RV (cathode) to RA & thoracic patch (dual anodes) leads & EPI=3 patch leads. 6 pts had both ENDO & EPI leads tested. Simultaneous biphasic shocks were used in 8 pts with ENDO leads. Impedance was measured in each current pathway & shock efficacy analyzed. Results: 60 ventricular tachyarrhythmia episodes were studied.

SHOCK IMPEDANCE (Ohms)

	Simultaneous		Sequential	
Pathway	RV-RA	RV-Patch	RV-RA	RV-Patch
EPI	56±26	63±27	44±19	47±21
ENDO	81±27	125±59	69±24	70±18
p (EPI vs ENDO)	.07	<.05	<.05	<.05

SHOCK EFFICACY

	Simultaneous	Sequential	Total
EPI (18J)	7/8 (88%)	12/13 (92%)	19/21 (90%)
ENDO (20J)	10/16 (63%)	9/15 (60%)	19/31 (61%)
p (EPI vs ENDO)	>.2	<.05	<.02

20J biphasic simultaneous shocks were significantly more effective with ENDO leads successfully converting all 8 pts tested, 3 of whom had failed to convert with monophasic simultaneous & sequential shocks at the same energy level (p=.03).
Conclusions: 1) EPI leads have lower impedance & higher efficacy than ENDO leads for monophasic shocks. 2) Simultaneous biphasic shocks increase efficacy of ENDO lead systems in selected pts.

5:15

OPTIMAL PACING AND SENSING LEAD SYSTEMS FOR IMPLANTABLE HYBRID PACEMAKER-CARDIOVERTER-DEFIBRILLATORS

Ryszard B. Krol, Sanjeev Saksena, Nicholas G. Tullo, Sardul Singh, Amarkanth Saxena, Ravindra Karanam, Isaac Gielchinsky, Edward Burkhardt, Margaret Gordon, Debra Hibbard. Eastern Heart Institute, Passaic; UMDNJ-NJ Medical School, Newark, NJ.

We evaluated sensing & pacing thresholds in 34 pts with ventricular tachycardia (VT) or ventricular fibrillation (VF) who underwent a new implant (29 pts) or replacement of an old pulse generator (5 pts) with a new implantable pacemaker-cardioverter-defibrillator (ICD) [i.e. Medtronic 7216A or Guardian 4201/4202/4210]. These ICDs have either an integrated or true bipolar epicardial (EPI) or endocardial (ENDO) sensing-pacing lead system. They are capable of ventricular pacing, have programmable sensitivity threshold for tachycardia detection, programmable initial shock energy, & reconfirm the presence of arrhythmia during the charge sequence & before shock delivery. Pts underwent predischarge electrophysiologic study, and their mean followup was 7±5 months.
Results: A total of 9 pts underwent implant of ENDO lead system. 5 new implants & 4 of 5 pts who had generator replacements required ENDO leads due to inadequate pacing & sensing thresholds of EPI leads. At implant mean R-wave amplitude & pacing thresholds were comparable in 9 pts with ENDO leads (13.2 V and 1.0 mA respectively) & 25 pts with EPI leads (11.4 V & 1.1 mA respectively) (p>.2) In the EPI group loss of capture occurred in 7 pts. In the remaining 18 pts mean pacing thresholds increased from 1.1 to 2.9 mA (p<.001). In contrast mean ENDO pacing thresholds remained stable at 1.0 mV. Undersensing during induced VF occurred in 13 of 25 EPI pts resulting in delay &/or failure of shock delivery in 5 pts. VF undersensing only occurred when maximal programmed sensitivity was ≥0.7 mV. Undersensing was corrected by reprogramming or lead revision to new EPI (1 pt) or ENDO lead (2 pts) system.
Conclusions: 1) EPI leads for ICD have undesirable pacing & sensing characteristics for chronic application & may impair VF detection & pacing or shock therapy. 2) ENDO leads are preferable for ICDs when sensing is based solely on electrogram amplitude and in pts requiring demand or antitachycardia pacing.

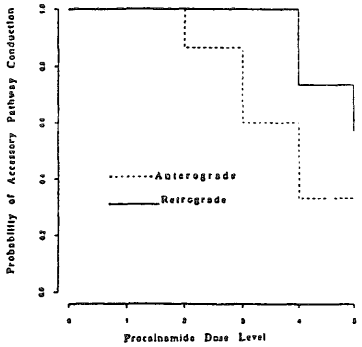
Monday, March 4, 1991
4:00PM–5:30PM, Room 254, West Concourse
Antiarrhythmic Agents: Cardiac Arrhythmias

4:00

DIFFERENTIAL EFFECTS OF PROCAINAMIDE ON ANTEROGRADE AND RETROGRADE ACCESSORY PATHWAY CONDUCTION

James W. Leitch, George J. Klein, Raymond Yee, Wee S. Teo, James Brown, University Hospital, London, Ontario, Canada

The effects of a graduated procainamide infusion on anterograde and retrograde accessory pathway (AP) conduction were compared in 15 pts. Atrial and ventricular stimulation were performed at each of 5 procainamide dose levels. Mean procainamide concentrations at each dose level were 6.5, 15.1, 33.8, 59.5 and 84.0 umol/L. At baseline, anterograde (AERP) and retrograde (RERP) AP effective refractory periods were similar (281±25) and 265±33 ms respectively, p=.12). During drug infusion, AERP increased to a greater extend than RERP (p=.03) and the probability of persistence of AP conduction in the anterograde direction was less than in the retrograde direction (p=.04) (figure). Eight of the 9 pts noninducible with atrial extrastimuli at baseline became inducible with atrial extrastimuli during procainamide infusion. Two patients developed near incessant tachycardia with ventricular stimulation at the 2nd and 3rd dose levels.



Conclusions: 1) Procainamide has more marked effect on anterograde than retrograde accessory pathway conduction. 2) This differential response may facilitate induction of tachycardia in some patients.

4:15

A RANDOMIZED MULTICENTER STUDY COMPARING THE EFFICACY AND SAFETY OF MORICIZINE, ENCAINIDE AND PLACEBO

A. Allen Seals, M.D. F.A.C.C., Jill Hartley, R.N., Robert A. Chahine, M.D. F.A.C.C., R. Michael Borland, M.D., Ph.D. and the Ethmozine (Moricizine) Study Group

In patients (pts) with symptomatic or potentially life-threatening ventricular arrhythmia, the efficacy and safety of Type 1 antiarrhythmic therapy has been questioned. In a large, multi-center study, 211 pts with ventricular arrhythmia were randomized in a parallel, double-blind design as follows: Moricizine (M)(450-900 mg/day), Encainide (E) (50-150 mg/day), or Placebo (P). In all pts, drug was titrated to maximum effective dose at 2 week intervals, and pt. responders were continued on M. Efficacy was defined as ≥ 80% reduction in ventricular arrhythmia frequency from quantitative 48 hour ambulatory ECG recording (Holter).
RESULTS: At baseline, 96 pts (45%) had non-sustained ventricular tachycardia, 98 pts (46%) had ischemic heart disease, and 68 pts (37%) were post-MI. The mean LV Ejection Fraction was 49% (range 14-80%). At maximum dose, M. pts had a relative response rate of 67%, compared to 48% for E. pts. and 6% for P. pts. (p<.01). Proarrhythmia occurred in 8% of E., 4% of M., and 2% of P. pts (p<.02).
CONCLUSIONS: In pts with frequent symptomatic or potentially lethal ventricular arrhythmia, Moricizine achieves superior efficacy rates with a lower incidence of proarrhythmia.